Chapter Nine

Management and Monitoring of Sensitive Resources

A. Management

1. MSCP Covered Species

The following species are MSCP covered plant and animal species known to occur on either the Carmel Mountain Preserve or the Del Mar Mesa Preserve. Each species has specific management directives for their management within the MSCP preserve system. Management directives for each species are from Table 3-5 of the MSCP contained within Appendix 4 (City of San Diego 1997; Appendix 4).

a. Plants

Del Mar Manzanita

Del Mar manzanita is a federally endangered species that is restricted to sand stone bluffs. Within the City of San Diego MSCP 67 percent of the known habitat (southern maritime chaparral) and 91 percent of the major populations are covered. Area-specific management directives must include specific management measures to address the autecology and natural history of the species and to reduce the risk of catastrophic fire. Management measures to accomplish this may include prescribed fire (see Section 9.C.).

This species is confined to the coastal areas of San Diego and open spaces within the Metro-Lakeside-Jamul segment of the MSCP. Development is the primary risk to this species.

Management of this plant should include, the mapping of known locations, protection of the species, and expansion of the range. An aggressive weeding regime would have the dual effect of removing competition allowing the species to expand and to remove the fuel source near the ground, which if ignited could cause damage to the seeds and crowns. Other threats include invasive weeds, trampling, and brush management activities.

Orcutt's Brodiaea

This species is a federal species of concern that is most commonly associated with vernal pools.

All of the major populations are located within the MSCP. All of the population will be conserved under the MSCP. Area-specific management directives must include specific measures to protect against detrimental edge effects.

Orcutt's brodiaea is found within the preserve near vernal pools. The major threat to this species is competition by invasive weeds and vehicular and recreational activity. When this plant is located in undisturbed habitat, the native cover of the chaparral and other native plants suppresses the expression of the invasive weeds. Areas that have been disturbed or are exposed to an edge, such as a road or trail, allow weeds to gain a foothold and eventually blanket the habitat.

By minimizing edge effects along trails and roads and implementing an aggressive weed control program, the functional values of the habitat can be restored to a functional state. Vehicular and recreational traffic on the Preserves should also be monitored to reduce disturbance to this species.

Wart-stemmed Ceanothus

This is a federal species of concern. Wart-stemmed ceanothus is a rounded evergreen shrub associated with chaparral on dry hills and mesas within San Diego. Sixty-seven percent of the major populations will be conserved in the City's MSCP.

Within the appropriate habitats, restoration of this species is required by the MSCP. Area-specific management directives for the protected populations must include specific measures to increase populations. Area-specific management directives must include specific management measures to address the autecology and natural history of the species and to reduce the risk of catastrophic fire. Management measures to accomplish this may include prescribed fire. Any newly found populations should be evaluated for inclusion in the preserve strategy through acquisition, like exchange.

Within the preserve, this species is found in southern mixed chaparral on Carmel Mountain. Measures should be taken to remove invasive weeds that may compete with this species. This will have the dual action of expanding the habitat, and removing the ground level fuel source that would damage crowns and bulbs as the fire moved through the vegetation. Currently, wart-stemmed ceanothus is common on Carmel Mountain and efforts to increase population size are not recommended at this time. Implementation of weeding programs will likely maintain the status of this species on the Preserve.

Del Mar Sand Aster

Del Mar sand aster is a federal species of special concern. This species is limited to the sandstone soils that are found within the preserve. Area-specific management directives for the protected populations must include specific measures to protect against detrimental edge effects to this species, including specific management measures to address the autecology and natural history of the species and to reduce the risk of catastrophic fire. Management measures to accomplish this may include prescribed fire. Threats to existing populations on the Preserves include vehicular and recreational traffic, weed invasion and road grading. Information gathered from surveys conducted by the City of San Diego should be used to develop management strategies. Expansion of the populations would be possible through a plant propagation program. Confining recreational activities to the designated trail system will minimize edge effects. Habitat for this species can be enhanced through the removal of exotic plants. Exotic plant control would reduce the effect that a fire would have upon the plants.

Short -leaved Dudleya

This species is listed as state endangered and proposed as federally endangered. Under the MSCP, 98 percent of major short-leaved dudleya populations will be conserved, mainly on land administered by the Bureau of Land Management (BLM) (City of San Diego). Management directives for this species require specific measures for maintaining and increasing populations, reducing risk of catastrophic fire, addressing autoecology and natural history and using prescribed fire if necessary. Management directives for this species are discussed further in this chapter and in detail in Chapter 8.

San Diego Button Celery

San Diego button celery is a federally and state listed endangered species. It is also on the MSCP's list of narrow endemics. This species is limited to salt marshes and vernal pools. Eighty-two percent of the major populations are covered under the MSCP. There are also important populations that are found on military installations throughout the county. Area specific management directives must include specific measures to protect against detrimental edge effects.

The population on Del Mar Mesa is likely subject to edge effects such as; vehicular and recreational activity, road grading and weed invasion. To ensure the survival of the species on Del Mar Mesa, an aggressive restoration effort, outlined in Chapter 8,should be implemented. This will improve the quality of the habitat by protecting and enhancing the vernal pool habitat for San Diego button celery. Protection will include directing all activities to less sensitive areas when possible. Enhancement would involve restoring the natural hydrology to disturbed pools, removal of exotic plants and the reintroduction of plant propagules.

Coast Barrel Cactus

Coast barrel cactus is a federal species of concern. It is usually found on dry hills with open coastal sage scrub. The MSCP conserves 81 percent of the major populations. Area-specific management directives must include measures to protect this species from edge effects, unauthorized collection, and include appropriate fire management and control. This species is currently threatened by vehicular and recreational activity on the Preserves. The populations within the Preserves should be protected and enhanced by redirecting activities to less sensitive areas when possible and by implementing an aggressive weed control program, as outlined in Chapter 8. Exotic plant control would reduce the effect that a fire would have upon the plants.

San Diego Goldenstar

The San Diego golden star is a federal species of concern. It is associated with chaparral and coastal sage scrub on dry hills and mesa tops. Area-specific management directives must include monitoring of the transplanted populations and specific measures to protect against detrimental edge effects to this species Vehicular and recreational activity pose the major threat to the current populations on the Preserves. Redirecting activity to less sensitive areas when possible is recommended. Invasive weeds should also be managed by the implementation of a weeding program, to maintain the status of this species on the Preserves.

Torrey Pine

The Torrey pine is a federal species of special concern. This distinctive pine is limited to microhabitats located only in Del Mar and Santa Rosa Island off of the coast of Ventura. The main population is located at Torrey Pines State Reserve and is under management.

Infestation by the bark beetle (*Ips paraconfusus*), and human-induced fires have been contributing to this species decline in San Diego County (Reiser 2001). This species should be monitored regularly for the presence of beetle activity. Exotic plant control would reduce the effect that a fire would have upon this species.

A small number of pines are located in two areas on the Carmel Mountain Preserve. It is not known if these individuals are native or the result of cultivation. They should be incorporated into the overall enhancement plan of the preserve.

San Diego Mesa Mint

San Diego mesa mint is a federal and state listed endangered species. It is associated with vernal pools and surrounding complexes. Many of the populations occur on military installations and are protected by federal agencies. Area specific management directives must include measures to protect against detrimental effects, maintain surrounding habitat for pollinators, and maintain pool watersheds.

The population on Del Mar Mesa is subject to direct vehicular and recreational activity, as it is associated with the vernal pool complex along the existing trails and roads. To ensure the survival of the species on Del Mar Mesa, redirection of activity around this habitat is recommended. The implementation of an aggressive restoration effort should be undertaken to improve the quality of the habitat by protecting and enhancing the pools that the species is associated with. Enhancement of this habitat

would involve restoring the correct hydrology, removal of exotic plants and the reintroduction propagules.

b. Invertebrates

San Diego Fairy Shrimp

The San Diego fairy shrimp is a federally endangered species and is covered by the MSCP. This species spends its entire lifecycle in vernal pools. Vernal pools are not independent systems, but are a part of a vernal pool complex in which individual pools are a subpopulation. The primary goal in the recovery of the fairy shrimp is to secure existing vernal pools and their watersheds from further loss and degradation in a configuration that maintains habitat function and species viability (USFWS 1998). Approximately 83 percent of vernal pool habitat is preserved in the MSCP preserve system (City of San Diego 1997). Additional protection is provided by local and federal wetland regulations. MSCP management directives require that area specific management directives for preserves protect vernal pools against edge effects that may harm the species. Numerous vernal pools and depressions that pond water are present within the existing roads, SDG&E access roads and trails on Carmel Mountain and Del Mar Mesa Preserves. Direct vehicular and recreational activity is the major threat to this species.

Individual vernal pool and habitat restoration recommendations are discussed in Chapter 8 in detail. Management recommendations include performing surveys, to determine their distribution. Monitoring for the San Diego fairy shrimp and management of the existing habitat and restoration of disturbed vernal pools is also recommended. The future closure of roads and trails through the vernal pool complex on the Preserves is recommended to avoid the degradation of the watershed and protect listed species. Fencing around sensitive areas and signage encouraging visitors to stay on paths is also recommended. Placing language on signs throughout the preserves stating that damaging the habitat of a federally listed species may also be a deterrent. Routine patrolling of all fenced off sensitive areas, especially the vernal pool preserve on Del Mar Mesa, is essential in maintaining the integrity of the fencing and landscape.

c. Reptiles

Belding's orangethroat whiptail

Belding's orangethroat whiptail is a federal and state species of concern and is covered under the MSCP. There is insufficient information on this species' breeding and egg-laying habitat requirements, but it is known to inhabit coastal sage scrub, chaparral, mixed chaparral and woodland habitats (County of Riverside 2000). Approximately 59 percent of the potential habitat and 62 percent of all known point occurrences will be conserved in the MSCP preserve system (City of San Diego 1997). The Plan requires monitoring of populations, habitat linkages to other protected areas, adaptive management practices and edge effect management directives to be instituted on preserves that support orangethroat whiptails.

Belding's orangethroat whiptails are known from two locations on Carmel Mountain Preserve and two locations on Del Mar Mesa Preserve. Suitable habitat is present on both Preserves to support the species. Pitfall traps have been installed on the Carmel Mountain and Del Mar Mesa Preserves as part of the MSCP Herpetofaunal Monitoring Program.

Management for orangethroat whiptail on the preserves will consist of continued monitoring efforts, maintaining existing potential habitat, encouraging habitat inhabited by prey species, and maintaining linkages to off-site habitat. Belding's orangethroat whiptail's preferred prey species is termites, and areas where this prey would be present, such as in woodpiles and litter. This habitat must be maintained and encouraged. Populations near development should be monitored for trends that might

change due to edge effects such as domestic pets, exotic plants, and invasive ants (USGS and San Diego State University [SDSU] 2001).

San Diego Horned Lizard

San Diego horned lizard is a CDFG species of concern and is covered under the MSCP. The San Diego horned lizard occurs primarily in coastal sage scrub habitat. Under the MSCP, approximately 60 percent of potential habitat and 63 percent of point occurrences for this species will be conserved. The Plan requires area-specific management directives to maintain native ant species, discourage the Argentine ant and protect the species against detrimental edge effects (City of San Diego 1997). Nine occurrences of San Diego horned lizard have been documented within the southern mixed chaparral and coastal sage scrub on Carmel Mountain and five within the chaparral on Del Mar Mesa Preserve. Suitable habitat exists on both Preserves to support this species. Pitfall traps have been installed on the Carmel Mountain and Del Mar Mesa preserves as part of the MSCP Herpetofaunal Monitoring Program. Management for this species will include maintaining the existing suitable habitat and maintaining linkages to off-site habitat. Monitoring efforts to detect the species should continue. Irrigation and trash within the preserve should be controlled in order to discourage Argentine ants, which displace native ant populations. In addition, restoration of non-native grassland areas should be undertaken in areas that may support the species. The Center for the Reproduction of Endangered Species (CRES) has been monitoring the San Diego horned lizard for the past six years and has identified biological differences in horned lizards that inhabit disturbed habitat types. Horned lizards that inhabit disturbed habitats have a smaller body size and larger home range with lower plant diversity than those lizards found in pristine coastal sage scrub habitats (Zoological Society of San Diego 2001). This species tends to occur along roadsides, near thick vegetation. It is recommended that new trails and roads should not be created where the species is known to occur (USGS and SDSU 2001). In addition, educational signage should be placed throughout the preserve indicating the sensitivity of the animal and discouraging its removal as a pet.

d. Birds

Coastal California Gnatcatcher

The coastal California gnatcatcher is federally listed as threatened, is a CDFG species of special concern, and an MSCP covered species. The coastal California gnatcatcher typically occurs in or near sage scrub and prefers habitat dominated by California sagebrush. The bird also uses chaparral, grassland, and riparian woodland habitats where they occur adjacent to sage scrub.

Approximately 73,300 acres of existing and potential habitat for the coastal California gnatcatcher will be conserved and linked together within the MSCP preserve (City of San Diego 1997). MSCP management directives for this species include; measures to reduce and minimize disturbance to habitat during the nesting period from mid-February to August, and fire protection measures to reduce the potential of habitat degradation and conversion due to unplanned fires. Areas containing high value gnatcatcher coastal sage scrub habitat are priority conservation areas. Management measures to maintain or improve habitat quality of high value conserved habitat is also required by the management directives for this species (City of San Diego 1997). No clearing of occupied habitat within the cities' MHPAs is allowed during the breeding season from March 1 to August 15. Coastal California gnatcatchers have been observed on Carmel Mountain and Del Mar Mesa Preserves within coastal sage scrub and chaparral habitat (see Figures 3-4 and 3-8). It is recommended that suitable habitat on the Preserves be monitored for coastal California gnatcatcher to determine presence of the species, and the appropriate areas of habitat to be maintained or restored if

necessary. Habitat around known nesting areas should be enhanced, and protected to discourage humans or domestic animals from disturbing the habitat. Occupied gnatcatcher areas should be monitored for the presence of brown- headed cowbirds (*Molothrus ater)*, to prevent brood-parasitism.

Cooper's Hawk

The Cooper's hawk is a CDFG species of special concern and an MSCP covered species. This hawk mainly breeds in oak riparian woodlands and on rare occasions may also use eucalyptus trees (Unitt 1984). Under the MSCP approximately 59 percent of potential oak woodland, chaparral, and sage scrub foraging habitat and 52 percent of potential oak riparian and woodland nesting habitat for this species is conserved. MSCP management directives for this species include 300-foot impact avoidance areas around active nests and minimization of disturbance in oak woodlands and oak riparian forests.

The eucalyptus woodlands and individual eucalyptus on Del Mar Mesa Preserve should be monitored for potential nesting activity during the breeding season. If active nests are located, signage should be placed at the appropriate intervals around the area restricting access during breeding season.

Northern Harrier

The northern harrier is a CDFG species of special concern and a MSCP covered species. Northern harrier nesting sites are considered sensitive. The northern harrier most commonly nests on the ground at the edge of marshes, but will also nest on grasslands, fields, or in areas of sparse shrubs. Northern harriers have nested in San Diego County at the Tijuana River, Otay Mesa, Lake Hodges, and Camp Pendleton and active nesting is known to occur in the Tijuana River Valley, South San Diego Bay, Sweetwater Marsh and in Proctor Valley (Unitt 1984; City of San Diego 1997). Harriers exhibit nest area fidelity and will forage up to four miles from their nest sites (City of San Diego 1997). Under the MSCP 42 percent of potential northern harrier nesting habitat and approximately 85,000 acres of potential northern harrier foraging habitat will be conserved. MSCP Management directives for this species include: (1) managing agricultural and disturbed lands within four miles of nest sites that are to become part of the MSCP preserve system to provide foraging habitat, (2) prioritizing grassland and wetland habitats for conservation within the preserve system, (3) impact avoidance areas of 900 feet or to the maximum extent possible within a preserve around active nest sites, and (4) maintaining wintering habitats within key wintering areas in San Diego County.

Northern harriers are not expected to nest on either preserve, however, the preserves support ample foraging habitat to support the species. Management for northern harrier should be directed at maintaining foraging habitat on both Carmel Mountain and Del Mar Mesa Preserves.

Southern California Rufous-crowned Sparrow

The southern rufous-crowned sparrow is a CDFG species of special concern and an MSCP covered species. Southern California rufous-crowned sparrows are year-round residents that can be found in coastal sage scrub that is generally steep and rocky and in grassy areas of coastal sage scrub (Unitt 1984). Southern California rufous-crowned sparrows are also known to inhabit grassland areas that have been created by fire and human disturbance when the grasslands are adjacent to coastal sage scrub (Unitt 1984). Under the MSCP approximately 61 percent of potential southern California rufous-crowned sparrow habitat, in addition to 71 percent of mapped localities for the species is conserved. MSCP specific management directives for this species include maintenance of fire processes to perpetuate herbaceous components in open phases of coastal sage scrub.

The southern California rufous-crowned sparrow is tolerant of edge effects, small habitat patches, low shrub volume and short-

term habitat disturbance (City of San Diego 1998b). According to Unitt, favorable southern California rufous-crowned sparrow habitat occurs within Los Peñasquitos Canyon to the south of Del Mar Mesa Preserve (1984). Management for the southern California rufous-crowned sparrow should be directed at maintaining the native herbaceous component within the sparrow's habitat, either by prescribed burns or manual methods.

Western Bluebird

The western bluebird is an MSCP covered species. During the spring this bird breeds in open woodlands of oaks, riparian deciduous trees, or conifers with herbaceous understory and in winter, uses more open habitats as well. Western bluebirds generally require trees and shrubs for cover and will nest and roost in cavities of trees or snags. Under the MSCP 59 percent (15,000 acres) of potential western bluebird habitat will be conserved. The persistence of this species largely depends on the conservation of existing large populations of western bluebird on public lands east of the MSCP plan area (City of San Diego 1997).

Competition from European starlings and house sparrows has reduced eastern bluebird populations in parts of the eastern U.S., and threatens western bluebirds (Zeiner et al. 1990). Proximity to development increases the likelihood of starling and house sparrow presence (Marzluff and Ewing 2001). Management for the western bluebird should be directed at enhancing habitat around occupied habitat or nesting areas to discourage humans, domestic animals and pest species from entering the area.

Western Burrowing Owl

The burrowing owl is a CDFG species of special concern and is an MSCP covered species. This species was observed during surveys on-site by RECON (1994), however, was not mapped.

It is believed that burrowing owls may occur wherever there are ground squirrel colonies as squirrels are the primary excavators of burrowing owl burrows. These animals exhibit high site fidelity, reusing the same burrow year after year (Rich 1984; Feeney 1992). Under the MSCP, approximately 4,000 acres of known suitable habitat and 5,770 acres of potential habitat within grassland vegetation communities will be conserved. Specific survey protocol and mitigation guidelines have been formulated for this species (California Burrowing Owl Consortium 1993) but are not legally required. MSCP management directives for burrowing owl include the enhancement of known, historical, and potential burrowing owl habitat, and the management of ground squirrels. Management measures will include the construction of artificial burrows and vegetation enhancement to enhance foraging habitat (City of San Diego 1997). Within preserve areas, burrowing owl nests should be monitored to determine use and nesting success, predator control measures must be employed and a 300-foot impact avoidance area around occupied burrows must be established.

e. Mammals

Mountain Lion

The mountain lion is not a sensitive species but is covered under the MSCP, and protected for its aesthetic and intrinsic value, as the largest native carnivore in the plan area (City of San Diego 1997). The mountain lion requires large continuous tracts of land as their home ranges can vary from 13- 800 km^2 (Hansen 1992). Approximately 105,000 acres of mountain lion habitat is conserved with the MSCP preserve system (City of San Diego 1997). Under the plan, core and linkage areas were designed to maintain ecosystem function including large animal movement throughout different areas of the preserve system. Wildlife agencies are required to monitor the MSCP preserve area for changes in ecosystem function and develop adaptive management strategies should the need arise. In each subarea plan of the MSCP linkages and road crossing/under crossings in wildlife movement areas are design requirements.

This species is constrained in the western areas of the MSCP preserve system by expanding residential development and loss of protective habitat. The mountain lion is known from historic sightings at Carmel Mountain and Del Mar Mesa Preserves (see Figures 3-4 and 3-8). The Los Peñasquitos and Del Mar Mesa Preserves are directly connected at the western end of the Del Mar Mesa Preserve and at three crossings along Park Village Road. Should mountain lions move into Los Peñasquitos Canyon, they could access the Del Mar Mesa Preserve from either of the four connection points. Access to the Carmel Mountain Preserve is constrained by the high density of residential development on all sides. Given the small size of this Preserve, it is unlikely to support this species.

Wildlife movement is monitored by the San Diego Tracking Team in Los Peñasquitos Canyon Open Space Preserve. In addition to monitoring conducted by the San Diego Tracking Team, several sites in Del Mar Mesa and Los Peñasquitos Canyon have been monitored as part of a wildlife corridor study by the Conservation Biology Institute as part of the MSCP. No mountain lion tracks were identified at any of the study sites in the vicinity of Del Mar Mesa or Los Peñasquitos Canyon (Hayden 2001).

Southern Mule Deer

The southern mule deer is not a sensitive species, but is also covered under the MSCP for its aesthetic and intrinsic value, as the largest native herbivore in the plan area (City of San Diego 1997). The mule deer is the principal food source of the mountain lion. Mule deer utilize and modify several different plant communities: coastal sage scrub, chaparral and oak woodlands. Approximately 105,000 acres of mule deer habitat is conserved with the MSCP preserve system (City of San Diego 1997). Under the plan, core and linkage areas were designed to maintain ecosystem function including large animal movement throughout different areas of the preserve system. Wildlife agencies are required to monitor the MSCP preserve area for changes in ecosystem function and develop adaptive management strategies should the need arise. In each subarea plan of the MSCP linkages and road crossing/under crossings in wildlife movement areas are design requirements.

In contrast to the mountain lion, mule deer are not as constrained within the MSCP Preserve system, as they are able to adapt to development in low densities and can move throughout urban canyons. Mule deer are known from historic sightings at Carmel Mountain and Del Mar Mesa and have been actively monitored by the San Diego Tracking Team since 1997 (Friends of Los Peñasquitos 2002). Mule deer are routinely sighted in Los Peñasquitos and use the canyons in and around Del Mar Mesa for movement (Friends 2002, Hayden 2001). Mule deer and other mammals use the SDG&E access roads to the west of Park Village Road to move between Del Mar Mesa and Los Peñasquitos in addition to other areas (Hayden 2001).

RECOMMENDATIONS

Any mountain lion sighting on the Carmel Mountain and Del Mar Mesa Preserves should be reported to the Habitat manager and CDFG and be recorded. A mammal tracking program similar to the Los Peñasquitos wildlife tracking program is recommended for the Del Mar Mesa Preserve, to monitor large mammal movement through the Preserve. Revegetation of areas identified as areas of frequent wildlife movement is encouraged to provide cover and facilitate animal movement. In addition, road undercrossings for all roads that cross open space contiguous with Del Mar Mesa should be design considerations to diminish the potential for human/mountain lion interaction deer mortality on roadways. Illegal dumping, vehicular traffic and off leash dogs are detrimental to wildlife movement and should be controlled within the Preserve boundaries (Hayden 2001). Fencing around the Preserve boundaries, signage requiring leashed pets and routine patrolling of Preserve boundaries for enforcement purposes are recommended.

2. Other Sensitive Species Not Covered by MSCP

There are several plant and animal species on the Preserves that are considered sensitive, but not covered by the MSCP. Specific management directives are provided for below. Future surveying and monitoring of all plant and wildlife species discussed below is recommended as funds become available.

a. Plants

For most of the sensitive plants present on the Preserves, invasive weeds are the primary threat to the existing populations. These weeds may increase the risk of fire and have detrimental effects to the plants. Vehicular and recreational activity is also a major cause of disturbance to the sensitive resources on the Preserves. Trampling, and destroying the vegetation allows for the exotic weeds to become opportunistic. Redirecting activity to less sensitive areas when possible is recommended, and implementing an aggressive weeding management program to reduce the possibility of destructive fire. These guidelines should be considered when managing the following sensitive resources on the Preserves:

- California adolphia (*Adolphia californica*)
- South coast saltbush (*Atriplex pacifica*)
- San Diego sagewort (*Artemisia palmeri*)
- Seaside calandrinia (*Calandrinia maritima*)
- Summer holly (Comarostaphylis diversifolia ssp.diversifolia)
- Sea Dalia (*Coreopsis maritima*)
- Western Dichondra (*Dichondra occidentalis*)
- Palmer's grappling hook (*Harpagonella palmeri*)
- Little mousetail (*Myosurus minimus ssp.apus*)
- California adder's-tongue fern (*Ophioglossum californicum*)
- Nuttall's scrub oak (*Quercus dumosa*)
- Ashy spike-moss (*Selaginella cinerascens*).

b. Wildlife

Reptiles and Amphibians

The current herpetofaunal monitoring being conducted on both of the Preserves (see Section 9.B), as required by MSCP, will contribute to the knowledge of species diversity present and how to better manage them.

The major threats to amphibian and reptile species on the Preserves include unauthorized vehicular and recreational traffic. Vernal pools provide habitat and important resources for amphibians and reptiles alike. Because the majority of the pools are located in roads and trails, redirecting recreational activity to less sensitive areas on the Preserves is recommended. Educating the public of the benefit of these resources is also important, to eliminate destruction and entrapment of species. Signage is also recommended in habitat occupied by the species mentioned below.

Those sensitive amphibian/reptile species not covered by the MSCP include: Western spadefoot toad (*Spea hammondii*), two-striped garter snake (*Thamophis hammondii*) and the northern red diamond rattlesnake (*Crotalus exsul*).

Birds

Habitat degradation is the major threat to avian species on the Preserves. Guidelines suggested below should be considered when managing the following sensitive resources not covered by the MSCP on the Preserves:

- White-tailed kite (*Elanus leucurus*). These birds prefer to nest in riparian woodland, live oaks, or groves of sycamores, and forage in any open, grassy area. It is recommended that the Eucalyptus groves be monitored for nesting, and that their preferred foraging habitat be enhanced. Open spaces occur on both preserves, and should be enhanced by implementing a weed

control program, and by confining activity to the designated trail system.

- California horned lark (*Eremophila alpestris actia*). These birds typically inhabit grasslands, mesas, and areas with sparse vegetation. It is recommended that these open spaces be enhanced by implementing a weed control program, and by confining activity to the designated trail system.
- Blue-gray gnatcatcher (*Polioptila caerulea*). This bird will winter in chaparral occasionally, and breeds in foothill chaparral, and riparian woodland. Brood-parasitism by brown-headed cowbirds is a threat to this bird. Recommendations for managing this bird include confining activity to designated trail system, and regular monitoring for brown-headed cowbirds in known locations of gnatcatchers.
- Loggerhead shrike (*Lanius ludovicianus*). This bird inhabits grasslands and chaparral, and prefers open areas with perches for hunting and fairly dense shrubs for nesting. It is recommended that these open spaces be enhanced by implementing a weed control program, and by confining activity to the designated trail system.
- Bell's sage sparrow (*Amphispiza belli belli*). This bird prefers interior chaparral, and coastal sage scrub habitats, including dense stands of chamise chaparral. It is recommended that activity be confined to the designated trail system, and that coastal sage scrub habitat be enhanced when necessary, and confining activity to the designated trail system.
- Grasshopper sparrow (*Ammodramus savannarum*).This bird prefers areas of tall grass, often when mixed with coastal sage scrub. It is recommended that activity be confined to the designated trail system, and that coastal sage scrub habitat be enhanced when necessary, and confining activity to the designated trail system.

Future surveying and monitoring of all species discussed below is recommended as funds become available.

Mammals

One mammal not covered by the MSCP, is present on the Preserves, the San Diego black-tailed jackrabbit (*Lepus californicus bennettii*). This species prefers open or semi-open country. Maintaining the integrity of the natural open spaces on the Preserves is recommended.

B. Biological Monitoring

1. Current Monitoring Efforts

Monitoring biological resources is a means to track the changes of the ecological system over time. More than merely inventorying and categorizing plants, animals and other organisms, monitoring provides the data that, when analyzed, allows decisions to be made regarding management of the Preserves. The following species are currently being monitored on Carmel Mountain and/or Del Mar Mesa Preserves by the City of San Diego according to the MSCP's requirements.

2. Plant Species Currently Monitored

a. Short-leaved dudleya

Short-leaved dudleyas on Carmel Mountain are monitored annually by the City of San Diego according to the Biological Monitoring Plan for the MSCP (Ogden 1996). Transects through the three subpopulations on Carmel Mountain are sampled. The results have been documented (City of San Diego 2001). Results of the monitoring show that the number of short-leaved dudleyas on Carmel Mountain has increased over the past five years:

1999 27,000 individuals within three subpopulations

2000 23,500 individuals within three subpopulations
2001 66,637 individuals within three previously known subpopulations, an expanded portion of subpopulation 3, and a new subpopulation adjacent to subpopulation 1

Both flowering and non-flowering plants were censused, however, Dodero (personal communication) has explained that many more underground caudexes may be present than are expressed in above ground vegetative and flowering parts in any given year. (See Chapter 8 for further discussion.) City staff has made the following recommendations regarding the monitoring of short-leaved dudleya (City of San Diego 2001):

1. Investigating sampling techniques that would not require stepping into the area of the populations.
2. Continue monitoring to determine if the reduction in off-road vehicle use and other access will benefit the species over time.
3. Establish permanent transects in the expanded portion of subpopulation 3 and the new population found adjacent to subpopulation 1.
4. Enhance the dudleya populations if it is determined over subsequent monitoring years that the subpopulations can support additional individuals.

b. Orcutt's Brodiaea

Orcutt's brodiaea on Carmel Mountain and Del Mar mesa are monitored every two years by the City of San Diego according to the Biological Monitoring Plan for the MSCP (Ogden 1996). The first year of monitoring began in 2001. No new populations were located, though it was previously found on Del Mar Mesa. Surveys will be conducted every two years; many plants may not have been visible at the time of the survey due to year-to-year variability.

c. Del Mar Sand Aster

Del Mar sand aster on Del Mar Mesa are monitored every two years by the City of San Diego according to the Biological Monitoring Plan for the MSCP (Ogden 1996). The first year of monitoring began in 2001.

d. San Diego Goldenstar

San Diego goldenstar on Del Mar Mesa are monitored every two years by the City of San Diego according to the Biological Monitoring Plan for the MSCP (Ogden 1996). The first year of monitoring began in 2001.

e. Del Mar Manzanita

Del Mar manzanita will be monitored every five years by the City of San Diego according to the Biological Monitoring Plan for the MSCP (Ogden 1996). Monitoring has not yet begun

f. Reptiles and Amphibians

The USGS and SDSU have been monitoring reptiles and amphibians and the two Preserves in 2001 as part of their monitoring within the MSCP region over the past six years (USGS and SDSU 2001). Their autecological study is focused at identifying which reptiles and amphibian species are present, when they are active, and what habitats they use. Their recommendations for other MSCP preserves (USGS and SDSU 2001) for species known to occur at the Carmel Mountain and Del Mar Mesa Preserves will likely be applicable to Preserves:

1. Western spadefoot toad. Add, by creation of new or rehabilitation of historic, upland breeding pools to the Preserves.
2. Orange-throat whiptail. Monitor edge populations for trends that might indicate population impacts from edge effects.
3. Coastal western whiptail. Because this species is often very active on dirt and paved roads, place signs along trails warning mountain bikers and others to be particularly watchful for this species. Quantify accidental deaths.
4. Coast horned lizard. Place new trails to avoid areas where the coast horned

lizard is known to occur, as this species is easily captured and often collected for pets. Educational signage indicating their protected status should be posted.

5. Red diamond rattlesnake. Maintain large intact core habitat areas, which are isolated from roads and trails.

In addition, the restriction from collecting reptiles and amphibians from the Preserves and from the wild, in general, should be incorporated into interpretation and public education programs.

g. Birds

Focused surveys for all coastal sage scrub dependent species and other sensitive species present on the Preserves should be conducted every two years. Should funding become available a program to monitor bird species fitness should be implemented. Measuring the diversity of birds in natural areas constrained by urbanized landscapes is insufficient (Marzluff and Ewing 2001). Reproduction, survival, and dispersal of individuals must be measured if management efforts are to be successful (Marzluff and Ewing 2001).

h. Coastal California Gnatcatcher

Focused surveys have been conducted in 2001 by URS for the City of San Diego on Del Mar Mesa. No coastal California gnatcatchers were detected at the site, although historical records exist. The coastal sage scrub in the canyons on site is a thick mixture of California sagebrush, black sage, and lemonadeberry *(Rhus integrifoli*a). There are pockets of chaparral vegetation interspersed, represented by such species as chamise *(Adenostema fasciculat*a) and mission manzanita *(Xylococus bicolo*r). The mesa top contains a sparse cover of coastal sage scrub.

The past three years have had below normal rainfall. These chronic dry conditions influence gnatcatcher reproduction and survival. Years directly following above-normal rains typically allow for good reproductive success and subsequent reoccupation of habitat patches unoccupied during dry periods.

MSCP preserve areas should be managed to maintain sufficient suitable coastal sage scrub habitat for coastal California gnatcatcher metapopulation viability.

i. Non-native Ants

The coast horned lizard relies chiefly on native harvester ants for food. Non-native ants often invade from disturbed and developed areas and displace the native species. The decline of the native ant species results in a decline in coast horned lizard, and possibly arthropod and other animal populations.

Ants are being monitored at MSCP preserve sites (USGS and SDSU 2001) and should be monitored at Carmel Mountain and Del Mar Mesa Preserves, which are bounded at several locations by development. Argentine ants are the most commonly encountered non-native ant species in their studies. They suggest that since Argentine ants in San Diego appear limited by moisture, irrigation from adjacent landscaping and the silt runoff from construction might encourage their spread into preserve areas.

j. Wildlife Corridors

Wildlife movement on Del Mar Mesa was recorded in the fall and summer of 2000. Track stations were placed along the service road near the entrance to Los Peñasquitos Park and were frequently disturbed by dogs, people and bikes. Deer tracks were detected along the service road. Coyote and bobcat scat and tracks were also found along the service road (fresh and historic). The west end of the park (north side of Peñasquitos creek) is closed to bikes (but rarely enforced) and is less frequently used by hikers than the south side of the creek. Coyotes and deer were seen frequently in the area during both monitoring seasons. Monitoring should be conducted yearly on both preserves to establish a base line of information that can be used to help direct management practices that will allow

movement of wildlife and use of the Preserves by the public.

2. Monitoring Requirements

The MSCP Biological Monitoring Plan designates certain monitoring activities throughout the City of San Diego. Table 9-1 lists the biological monitoring for Carmel Mountain and Del Mar Mesa.

Additional monitoring not required or detailed in the MSCP Biological Monitoring Plan include monitoring for vernal pools and ant diversity. Ant diversity studies were conducted on-site in 2001 and will continue based on the results and recommendations from the surveys to be submitted. Vernal pool monitoring of existing pools will also be conducted and those protocols will be developed and implemented as funding becomes available. Monitoring protocols for restored vernal pools have been included in the document.

The MSCP Biological Monitoring Plan may be revised to reflect current conditions and updated scientific information on the best sampling protocols. Any monitoring done should be modified to be consistent with the most current copy of the MSCP Biological Monitoring Plan.

In addition to quantitative monitoring, qualitative monitoring and presence/absence surveys should be conducted by MSCP or Park and Recreation staff as funding becomes available. The species listed above should be included in those surveys. Presence/absence, qualitative monitoring should also be conducted for *Atriplex pacifica* on Carmel Mountain. Additional sensitive species may be added on an as-needed basis. Presence/absence, qualitative

TABLE 9-1
CURRENT SPECIES QUANTITATIVE MONITORING REQUIREMENTS

Species	Monitoring Frequency
MSCP, Del Mar Mesa, MSCP Biological Monitoring Plan	
Del Mar manzanita	Every 5 years
Del Mar sand aster	Every 2 years
Orcutt's brodiaea	Every 2 years
San Diego goldenstar	Every 2 years
Upland reptile species*	Every 2 years
Habitat quality monitoring (southern maritime chaparral)	Every 5 years
MSCP, Carmel Mountain, MSCP Biological Monitoring Plan	
Del Mar manzanita	Every 5 years
Short-leaved dudleya	Every year
Orcutt's brodiaea	Every 2 years
Upland reptile species*	Every 2 years
Habitat quality monitoring (southern maritime chaparral)	Every 5 years

*Not included in 1996 MSCP Biological Monitoring Plan but is currently being conducted by MSCP.

monitoring of sensitive species should be conducted once a year on an as-needed basis by qualified staff as funding is available.

3. Volunteer Opportunities

Much data can be collected using trained volunteers. Examples of continent-wide programs that depend on volunteers for scientific monitoring and data collection of the biological resources are the National Audubon Society Christmas Bird Count and the Monitoring Avian Productivity and Survivorship (MAPS). Locally several monitoring programs also rely greatly on volunteers to collect the data. The San Diego Natural History's Bird Atlas, and the San Diego Audubon's monitoring of birds at the San Elijo Lagoon are just a few examples of volunteers contributing to the bank of data.

The MAPS program uses four basic requirements for successfully incorporating volunteers into their bird-banding operations (Burton 2000). These same four requirements are used for other volunteer programs and are applicable for encouraging volunteer participation in monitoring at the Carmel Mountain and Del Mar Mesa Preserves:

1. Recruitment. The southern California climate encourages outside activities and San Diego has many nature-based organizations from which to draw and encourage volunteers. To encourage people to volunteer, slide shows can be prepared and shared with local clubs and local chapters of national clubs and societies. Newspapers, television and radio stations, and photographers can be invited to distribute information regarding the monitoring program. The monitoring program must be appealing so the thrill, education, camaraderie and conservation benefits of volunteering should be stressed when trying to recruit volunteers.
2. Training. Short- and long-term training are usually necessary for volunteers since the time that people have to devote to "leisure" activities varies. Consistent and effective training ensures that the standardized data are collected.
3. Supervision. Many local professional biologists are members and leaders of local chapters of nature-based organizations such as the Audubon Society, the Sierra Club, and the California Native Plant Society. These professionals are often willing and interested in coordinating and overseeing data collection in the field and often in analyzing data.
4. Feedback. Volunteers need positive feedback to keep up their interest, enthusiasm and morale. They should be told how valuable they are to the program and how much their participation is appreciated. Letting them participate in data analysis and presentation lets them see the results of their efforts and how they fit into a larger monitoring and conservation picture.

C. Fire Management on Carmel Mountain and Del Mar Mesa Preserves

The Carmel Mountain and Del Mar Mesa Preserves both consist primarily of southern mixed chaparral, and chamise chaparral vegetation communities. Fire is an integral and important element of natural processes for chaparral communities in southern California. The chaparral covered hills combined with the long, dry summers make wildfires inevitable. If unmanaged, the thick dense masses of flammable vegetation that cover these lands has the potential to fuel intense catastrophic wildfires.

1. The Role of Fire in Chaparral Habitat

Older stands of chaparral, which have large amounts of dead material , increase the probability and intensity of wildfires.

Dense brush and shrubs shade the ground resulting in a loss of grasses and leafy plants which act as feed for a large number of animals, such as deer.

Younger stands of chaparral are not likely to burn as hot. If there is a fire, it is more easily controlled. Healthy young plants increase wildlife habitat and forage for most species.

One way to reduce the heavy accumulation of chaparral fuels and return a community to its natural system is to use prescribed burning. Prescribed burning is the use of fire in a designated area to modify the vegetation under carefully specified weather conditions. Fire provides a very natural tool to reduce the hazards of the chaparral environment. Fire is part of the ecosystem and it needs to be managed, not excluded.

Chaparral has evolved with fire, and it is now known that chaparral over 40 years old is likely to burn (CSE 1997-2001). The probability of a fire can be determined in a particular region with this information provided. Chaparral communities have evolved with fire to the point where it is dependent on fire for regeneration. Many species have done so by the production of plant material with large surface-to-volume ratios, by producing volatile oils (Chamise for example), and through periodic "die-back" of vegetation (Barbour, Burk, & Pitts 1980). Several species will produce large amounts of seeds that remain dormant until fire commences the germination process. Parent plants have evolved protection from fire by having thick layers of bark, allowing it to survive enough so that sprouts may grow following the blaze. It is commonly believed that fire has been an important component of chaparral communities for at least two million years; however, the true nature of the "fire cycle" has been subject to interpretation (California Coastal Commission [CCC] 1995).
Fire suppression was the preferred management tool in the early part of the twentieth century. Eventually, research showed that fire suppression increased fuel loads; therefore, by the 1970s fire management had taken another direction. Managers now work to minimize the risks associated with fire while allowing fire to play a more natural role in maintaining ecological processes and communities. Prescribed burns are used to reduce the fuel loads and prevent unexpected and intense fires. Prescribed burns adjacent to the urban wildland interface can present some challenging problems. Such complaints include:

- Potential health effects of the smoke.
- Reduced visibility and potential danger of the controlled fire escaping and endangering their residences.
- Compliance with Air quality regulations.

With these constraints in mind, urban wildland prescribed burnings must be done on a very limited basis. However, such prescribed burning can be a valuable cost effective fire management tool for protection agencies. The other alternative in the reduction of the fuel load may be accomplished by thinning or complete removal of vegetation.

2. MSCP Guidelines for Fire Management

A Fire Management Plan (FMP) is necessary for both Carmel Mountain and Del Mar Mesa Preserves to ensure that both biological and safety goals are met. The MSCP (City of San Diego 2001) has provided specific guidelines in Section 1.5.12.
Fire management in the City of San Diego primarily focuses on fuel or brush management, and is regulated by the Landscape Ordinance and Landscape Technical Manual, in conjunction with the Fire Department. The typical mesa-canyon topography and fire-adapted native vegetation of the coastal region has led to the common condition of development occurring on mesa tops surrounded by

canyon slopes of highly flammable chaparral and other natural open space. This typical condition has justifiably raised public safety concerns, which have been addressed by the City's Landscape Ordinance and Landscape Technical Manual. The formation of an open space system to protect biological resources and preserve long-term viability introduces additional issues regarding fire management that need to be addressed in conjunction with public safety factors.

Major issues related to fire management in the MHPA include the following:

- Fire hazard reduction methods, including brush management, for public safety purposes may impact sensitive species.
- Fire hazard reduction may involve methods that increase other management concerns (e.g., exotic species invasion, erosion).
- Native vegetation communities subjected to fire suppression over long periods of time often become woody and senescent, contributing to severe fire hazard for development in and adjacent to the MHPA.
- Senescent native vegetation no longer supports the diversity of species of areas allowed to rejuvenate through periodic non-catastrophic fire.
- Catastrophic fires can destroy soil structure, seed banks, root burls and other natural regeneration components, and act to convert native vegetation communities to non-native landscapes.
- Fire management needs for particular fire-adapted species such as Del Mar manzanita.
- Fire management for human safety, protection of property, and hazard reduction; and
- Fire management for biological resources.

The fire management plan should maintain human safety, yet be compatible with the conservation needs of the biological resources at the Preserves. Brush must be managed to reduce fuel and protect urban uses when development is adjacent to one of the Preserve. Currently housing bounds both Preserves and future adjacent housing developments will require brush management.

Given safety and cost considerations, prescribed burnings may be used when practical.

The fuel management zone between either of the Preserves and adjacent development will vary in width and may or may not occur within the Preserve. Brush management responsibility and ownership of the fuel management zones between development and either of the Preserves may vary. The zone may be owned and managed by the adjacent property owner or homeowners association, or it may be incorporated into the Preserve.

3. Goals and Objectives of Fire Management Plan

An FMP is a strategic plan that defines a program to manage wildland and prescribed fires and that documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational plans such as preparedness plans, preplanned dispatch plans, prescribed fire plans, and prevention plans.

Goals of the FMP may include, but are not limited to:

- enhancing biological diversity,
- enhancing threatened, endangered and/or other sensitive species populations,
- mimicking natural processes,
- providing diverse research opportunities,
- providing educational opportunities,
- interaction of various fire management agencies,

- reducing fire hazards by managing fuels and fire, and
- conducting safe burns.

a. Objectives in Developing a Fire Management Plan

1. Educate local Fire Department Agencies regarding sensitive resources on Carmel Mountain and Del Mar Mesa Preserves.
   a) Provide maps of sensitive biological and cultural resources on Carmel Mountain and Del Mar Mesa Preserves to local Fire Department Authorities. These areas should be avoided to the maximum extent possible. The maps should indicate preferable staging areas, access routes and "let burn" areas.

   b) Discuss and prepare basic guidance for minimizing impacts to biological resources when fighting a fire on Carmel Mountain and Del Mar Mesa Preserves. This guidance should include preferred access routes and natural and cultural resource priorities (i.e., Is it better to allow an area to burn than to risk soil disturbance adjacent to an archaeological site or a federally listed endangered plant species?).

   c) Provide contact information. Provide local Fire Department Authorities the appropriate contact information, in the event fire management activities may affect natural and cultural resources.

b. Preparing a Fire Management Plan

Prepare and implement a detailed Fire Management Plan, which follows guidance with the applicable fire management regulations:

a) Fire Management Units (FMUs) will be delineated for both Preserves based on anticipated wildland fire behavior, as determined on the basis of topography, watersheds, human activities, vegetation, urban interface, existing fuel breaks, and sensitive resources. Existing information on locations of all rare, threatened, and endangered species on the Preserves will be evaluated within every FMU. Existing data on archaeological sites shall also be incorporated into the assessment of each FMU.

b) A fire map for the Preserves will be prepared, which will include FMU boundaries, topography, major vegetation types, and other major surface features, including roads and structures.

c) A GIS Fire Atlas Tool, which includes the refinement of fire suppression and pre-suppression plans and the analysis of the effects of various management actions, will be developed. The Fire Atlas Tool will embody the primary procedures for pre-fire activity (prevention), suppression, protection, and avoidance of sensitive biological and cultural resources, and will serve as a field aid in time-critical decision making under conditions of wildfire.

d) Fire management guidelines for the Preserves as a whole and for each FMU will be prepared. These fire management guidelines will include objectives and tasks for pre-suppression, suppression, and post-suppression activities.

e) An evaluation will be conducted of the efficacy of the current system of fuel breaks on the Preserves. This will include recommendations for additional fuel breaks based on evaluation of the history and movement of fires within and from beyond both Carmel Mountain and Del Mar Mesa Preserves.

c. Other Considerations

A qualified biologist should monitor brush management activities within natural vegetation communities, within or adjacent to the Preserves.

Smoking should be prohibited within or adjacent to vegetation communities because ashes and burning cigarette butts tossed intentionally or unintentionally into the vegetation could spark a fire.

Fires and fireworks of any kind are prohibited.


draft

Chapter Ten
Cultural Resources

This chapter provides a background of the cultural resources on the Preserves, and defines requirements and provide procedures for compliance with federal and state laws, which apply to both the Carmel Mountain and Del Mar Mesa Preserves. This plan will be used by the Preserves' managers in making decisions regarding the management of cultural resources (historic properties).

A. Cultural Setting

1. Prehistoric Period

The area of the county occupied by the Preserves has a long and rich history of archaeological investigation. Malcolm Rogers, an early pioneer of archaeological survey, site documentation, and testing, concentrated his work in the southern California deserts and coast. Rogers, from the San Diego Museum of Man, recorded numerous local sites during the 1920s. He subsequently presented a cultural scenario for prehistoric people who created these sites. Rogers suggested that these people were nomadic gatherers who subsisted mainly on shellfish collected from beaches and around lagoons, and made stone tools which might best be described as "crude" (Rogers 1929).

Based on the proximity of these sites to the community of La Jolla, Rogers named this the La Jolla complex, or tradition, and the name has remained. It is interesting to note that Rogers hypothesized that the La Jolla complex was the oldest archaeological tradition in the region, primarily because of what he interpreted to be simple stone artifacts. This is now known to be incorrect. The La Jolla complex, as identified by Rogers, has been reliably radiocarbon dated between 8,000-2,000 years before the present (B.P.). The cultural materials identified as belonging to this tradition have been found in sites with radiocarbon dates as much as 8,500 years B.P.

Since the early proposition by Rogers that the La Jolla tradition was the most ancient of the archaeological manifestations in the San Diego region, clarification has been provided by the discovery of older materials and the recognition that the "crude" quality of the La Jolla artifacts is not a sound basis for a basal chronological placement. Later in his life, Rogers made it quite clear that his original thinking on this matter was in error.

The earliest archaeological materials in the county are attributed to a tradition, or phase, that is known as the San Dieguito. This phase, which begins in the county by about 9,500 years B.P., is a southern California reflection of a more ancient Folsom/Clovis tradition of large game and aquatic resource use concentrated around what are now desert areas and the Great Basin pluvial lakes of the late Pleistocene epoch (Moratto 1984). Artifacts of this period are generally described as stone bifaces, lanceolate projectiles, crescentics, and a variety of scrapers and choppers. Late in the tradition, pressure flaking was introduced. The site assemblages tend to be found as surface scatters or shallow deposits on ridge tops and overlooking the Pacific Ocean, leading

to a characterization of these people as nomadic hunters. Pleistocene megafauna began a decline, ultimately resulting in their extinction during the same time period as the first evidence of prehistoric human occupation begins in southern California (circa 10,000 B.P.). Thus, an economy based on large game hunting may have been practiced here for no more than 1,000 years. This may explain the relative scarcity of San Dieguito artifacts in the county. Ongoing research suggests that these people supplemented hunted foods and raw materials with gathered or foraged materials to a greater extent than was once portrayed. Sites of this ancient time are relatively unusual and often appear to have been disturbed or "contaminated" by archaeological materials from the subsequent traditions, the La Jolla and Kumeyaay.

Radiocarbon dating of two sites in western San Diego County, the Harris site and Rancho Park West, indicates that beginning circa 8,000 years B.P., the San Dieguito tradition was replaced by the La Jolla tradition, which held sway for roughly 6,000 years. There is considerable debate as to whether the San Dieguito people continued to occupy the county, or if they abandoned this area when the La Jolla tradition people arrived (Moriarty 1967; Kaldenberg 1982; Gallegos and Carrico 1984; Wallace 1978:28-30). Extinction of large game and the conversion to an already incipient maritime and floral resource orientation seems the simplest explanation of in situ culture change.

Stone tools of the La Jolla period appear to be "crude" compared with the San Dieguito holdings in items. Stone artifacts dating to the La Jolla phase sites do not reflect the variety of types and quality of craftsmanship that is represented in the San Dieguito tradition. There appears to be more expedient selection of raw material. Rather than searching out basalts and fine-grained metavolcanics, the La Jolla tradition people seemed content to use the more readily available river cobbles. This type of rock is not well suited to fine working, and many of the tools appear to have been created and used expediently as a need for a cutting or scraping edge arose. Fine craftsmanship is lacking in the lithic tools of this period, and there is little to suggest that stone working was anything but a means to an end. The La Jolla phase tools are often made from cobble-based core stones with unifacial and bifacial edge damage from scraping and battering. While there is obvious edge preparation, the removal of flakes from these tools is through hard hammer percussion, resulting in undulating and imprecise edges.

In contrast to San Dieguito sites, La Jolla phase sites tend to yield ground stone implements, predominantly manos, and slab or basin metates. The settlement pattern is also distinctive. Sites are found both inland and along the coastal margin, with concentrations in major drainages where plant resources could be processed and around the estuaries or lagoons. These sites often reflect a depth of cultural deposit that is not found at sites of the preceding phase, and at coastal locations, shellfish refuse accumulations are common. This is consistent with the economic adaptation of the La Jolla–era peoples. Exploitation of marine and seed resources requires a very different tool kit than that of hunting large game. Further, one would expect a very different social and cultural system to evolve out of these different adaptive strategies.

By circa 2,000 years B.P., Yuman-speaking people were present in the Gila/Colorado River drainage. Within a short time, some of these groups had migrated further west and entered Imperial and San Diego Counties, bringing changes in subsistence patterns, technology, and customs. The Yuman-speaking people are the ancestors of the ethnohistorically known Kumeyaay (also referred to in earlier literature as Diegueño due to their association with the San Diego Mission). Archaeological findings identify a number of changes resulting from this contact. Artifacts associated with this tradition include ceramics; small, finely worked triangular projectile points; bedrock milling equipment, in particular pestles and

mortars; and scrapers. One of the most distinctive markers of contact with desert groups is the introduction of ceramic technology. However, there is some evidence that the original Yuman speakers who entered the county 2,000 years B.P. did not use pottery and that the ceramic tradition was introduced as late as 1,000 years B.P. (Clevenger and Schultze 1995).

Yuman traditions of plant processing are also distinctive. These activities included grinding on bedrock surfaces, creating deep "conical" depressions on bedrock surfaces, and stone bowls. In addition to the mano and metate implements that were already present, the Yuman assemblage includes pestles and deeper and narrower mortars or bowls and the extensive use of bedrock outcroppings as processing areas. In this period, mortuary customs were also changed from flexed inhumation to cremation.

2. Historic Period

Spanish colonization of Alta California began in 1769 with the migration of Spanish and Mexican troops, religious personnel, and civilians into the San Diego region. The landing for the seagoing portion of this excursion was the San Diego Bay, with a landfall near the area that is identified as Old Town. This group was followed by an overland expedition and a settlement was established at the location that is now within Presidio Park. Within a few years, the sacred and military elements of the colonial forces were separated and the mission portion of this early settlement was moved to the east, in Mission Valley, where the settlement was named Mission San Diego de Alcala. The siting of this mission was on a large Native American village, which is known from ethnographic sources as Nipaguay.

Spanish colonial activities throughout Alta California affected all of the aboriginal groups from the coast, where initial contact took place, to the inland areas. The Mexican period (1822-1848) saw the continued displacement and disruption of traditional lifeways primarily through the expansion of the land grant program and development of extensive rancho holdings.

Granting of statehood and the gold rush brought many changes for California generally and for San Diego County specifically. By the late 1800s, development in the county was well under way with the beginnings of a recognizable downtown San Diego area and the gradual development of a number of outlying communities, many of which were established around previously defined ranchos and land grants.

The area directly around the two Preserves was not included in any of the rancho land grants in either the Spanish or Mexican periods. Carmel Valley to the north was the site of an open-range sheep ranch established in the 1770s by a retired soldier from the San Diego Presidio. This soldier, named Cordero, built an adobe dwelling in the valley, roughly located just east of I-5 and south of Carmel Valley Road. Cordero lived there until his death, and for a time both McGonigle Valley and Carmel Valley were referred to as "Cordero" (Northrop 1989:9).

Don Jose Antonio de Jesus Serrano built a second adobe in Carmel Valley (Northrup 1989:9). Although there are no structures dating to the Spanish or Mexican periods in the Preserve areas or immediate vicinity, it is likely that cattle and sheep, especially the Cordero flocks from the north, grazed the Carmel Mountain Preserve lands.

Rancho los Peñasquitos, granted to Francisco Maria Ruiz in 1823, is located east of the Carmel Mountain Preserve and forms the southern border of the Del Mar Mesa Preserve. Los Peñasquitos was the first private land grant of the Mexican period in San Diego County. In 1836 Ruiz, who had no spouse or descendents, deeded the ranch to Francisco Maria Alvarado. George Alanzo Johnson, was given one-half interest in the rancho in 1862, when he married into the Alvarado family. Johnson moved in and made considerable improvements to the rancho in the next 20 years. J. S. Taylor acquired the rancho in the early 1880s, remodeling the ranch house and continuing to run cattle. The rancho's

subsequent owners made some alterations and additions, using the ranch house as a bunkhouse. In 1974 the County of San Diego purchased 193 acres, including the Johnson Taylor ranch house complex, as part of a proposed Los Peñasquitos Regional Park.

Ranching was the main occupation of the residents in this part of the county from the late nineteenth through the early twentieth century. The largest ranch in the vicinity of the Carmel Mountain Preserve was owned by the George McGonigle family, for which McGonigle Canyon is named. In 1899, the McGonigles sold over 1,000 acres of land to the Sisters of Mercy, a Catholic order of nuns associated with Mercy Hospital. Structures were built and the sisters cultivated the surrounding land. The farm supplied vegetables and dairy products to Mercy Hospital (Mikesell 1988). The sisters named the property Mount Carmel Ranch, from which the valley took its modern name Carmel Valley.

Another family, the Knechtels, moved to the Carmel Mountain area from Nebraska in the 1890s. The original Knechtel homestead, now recorded and designated CA-SDI-11724H, is located in the northeast corner of the Carmel Mountain Preserve. Anton Knechtel occupied the homestead from 1889 to 1903. He was buried on his farm, the grave being located approximately 100 meters north of the farm site, on a ridge. Although no structures still stand at the farm site, foundations and piles of wood remain, and his grave remains in good condition. The Knechtel family continued to dry farm beans on various tracts of land in Carmel Valley through the late 1980s.

B. Cultural Resources on the Preserves

Literature and site records for recorded cultural resources within the two Preserves were reviewed in 2001 (Price and Cheever 2002). Archival information from the South Coastal Information Center and the San Diego Museum of Man show 65 previously recorded prehistoric and historic sites on the two Preserves.

1. Carmel Mountain

Cultural resources work within the last 10 years in the Neighborhood 8A Specific Plan area resulted in comprehensive surveying for cultural resources, and significance testing of a number of sites (City of San Diego 1998a). A total of 27 prehistoric and historic archaeological sites are recorded on the Carmel Mountain Preserve (Table 10-1). These recorded sites are generally sparse stone artifact scatters and special activity sites extending along the entire north and east margin of Carmel Mountain. The majority of these sites are characterized by small amounts of stone flakes and chipping waste, which are a byproduct of testing cobbles for suitable tool production material. The cobbles originate from the La Jolla geologic formation, eroding out along the edges of Carmel Mountain and the adjacent mesas. The sites often have a small amount of ground stone and/or a few stone tools in addition to the flakes. Sites containing such artifacts are considered special activity sites, with short term or single episode use, and are difficult to ascribe to a specific prehistoric group.

Possible hearths made of cobbles are present in some of the sites in the Preserve. A number of these features have been excavated, and moderate amounts of ground stone tool fragments have been found in association. In other cases, these cobble features are not directly associated with other types of artifacts and may represent individual events or features for specialized activities. These possible activities are described in the Carmel Valley EIR, Section 5.9 (City of San Diego 1998a).

Prehistoric sites with such cobble features and wider range of artifact tool types indicate a more intensive or longer-term usage than light artifact scatters. CA-SDI-4904 is a large site on the Preserve that contains several such cobble features and a variety of stone artifacts. Testing in 1992 found a subsurface deposit, and analysis of artifacts recovered led to a conclusion that

the site was primarily used for bulk seed processing (Eighmey 1994). Buckwheat, lemonadeberry, sages, manzanita, and native grasses grew on Carmel Mountain, and Native Americans used their seeds.

Two historic sites are recorded on the Carmel Mountain Preserve, the homestead of Anton Knechtel, and the gravesite of Anton Knechtel. The homestead consists of the remains of a wood structure, concrete cisterns and pad, historic trash scatter, and a grove of eucalyptus trees planted to shade the structure. The gravesite consists of the headstone and a picket fence surrounding it.

Of the 27 recorded sites on the Carmel Mountain Preserve, 14 prehistoric sites and the Knechtel homestead have been identified and evaluated for importance (under CEQA guidelines). Additional evaluations may be required under Section 106 guidelines of the NHPA if federal funds are involved in any future improvements at the Preserve. Three of the 14 sites evaluated are considered important under CEQA criteria, and the remaining 11 sites were determined not to be important resources. Four previously identified sites (SDM-W-379, CA-SDI-11727, -11729, and –11730) were not relocated during recent surveys. This may be the result of incorrect mapping during recording, or incorrect identification of natural material as prehistoric artifacts or vise versa during a survey.

2. Del Mar Mesa

All of Subarea V, which includes Del Mar Mesa, has been included in previous surveys (City of San Diego 1996). As a result of these surveys, 38 prehistoric and historic archaeological sites are recorded within the Del Mar Mesa Preserve boundaries (Table 10-2). Of these sites, 24 are prehistoric, two are historic, and 12 are prehistoric isolates. One prehistoric site (CA-SDI-11909), and one historic site (CA-SDI-13077H), were previously evaluated and the historic site was determined to be potentially significant (Schaeffer 1998).

The prehistoric sites are all listed as “lithic scatters,” “chipping stations,” or quarries. They are the result of testing the cobbles that eroded out of the ridge edges. The testing determined how suitable the material was. These sites have a limited variety of artifact types, usually consisting of flakes, shatter, cores, and possibly a few flaked stone tools. The potential for subsurface deposits is very low for such sites, due to the limited variety of tasks and small amount of time needed to test potential cobbles. No habitation sites that would have a wide range of artifact types or subsurface deposits were recorded. The 12 isolates consist of one or two flakes or cores and two stone tools.

The historic site, CA-SDI-13077H, has several cobble features, consisting of two small cobble circles, two large filled cobble circles, and a cobble rectangle with semicircular extensions. A low-density trash scatter surrounds the features. No determination of the age of the site has been proposed.

One of the prehistoric sites (CA-SDI-10138A-B) could not be relocated in recent surveys and is considered destroyed.

C. Cultural Resource Management

This section is intended to provide technical information specific to the laws pertaining to preservation and protection of prehistoric and historic properties and the appropriate methods to avoid, reduce, or otherwise mitigate adverse impacts resulting from programs and activities relating to the management of the Preserves.

Current and future activities at the Carmel Mountain and Del Mar Mesa Preserves may have the potential to damage or alter historic properties (historic or prehistoric cultural resource sites) eligible for the National Register of Historic Places or resources considered significant under CEQA and/or City of San Diego cultural resource guidelines. These activities include a variety of trail construction, maintenance programs, and potential increase use of the areas by the general public, which can result in differing effects of direct and indirect impacts to cultural resources.

These activities are considered an undertaking under the National Historic Preservation Act (NHPA). An undertaking is defined as:

> A project, activity, or program funded in whole or part under the direct jurisdiction of a federal agency (NHPA section 301[7]). This includes projects:
> Carried out by or for the agency;
> Carried out with Federal financial assistance;
> Requiring Federal permits, licenses, or approval;
> Subject to State or local regulations administered pursuant to a delegation or approval by a state or Federal agency.

All procedures in an undertaking must be in compliance with 36 CFR 800 guidelines (Appendix 7). The area of potential effect (APE) and any areas associated with the undertaking must be developed in consultation with the State Historic Preservation Officer (SHPO) and other consulting parties, including Native Americans, public agencies, and private property owners.

An undertaking is determined to have an effect when it:

1. may alter characteristics of the property, including relevant features of its environment or use, which qualify the property for inclusion in the National Register of Historic Places (NRHP) and/or is considered significant under CEQA or the City of San Diego Guidelines; and
2. may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Effects can be determined as beneficial or adverse. Beneficial effects of an undertaking can include restoration of an historic building or features, or enhancement or protection of an archaeological site, as examples. Adverse effects can include but are not limited to:

- Physical destruction, damage, or alteration of all or part of the property;
- Alteration of the character of the property's surrounding environment where that character contributes to the property's eligibility;
- Neglect of a property resulting in its deterioration or destruction;
- Alteration of a drainage or erosion pattern;
- Creation of access into previously inaccessible areas;
- Unauthorized collection; and
- Off-road-vehicle use

1. Process

The cultural resource management process consists of two parts:

a. Identification and Evaluation

The first step is identification and evaluation of cultural properties subject to potential project impacts. Resource identification and evaluation are conducted within research contexts that provide the criteria by which individual cultural properties can be assigned scientific or social significance. Those resources not meeting significance criteria receive no further management treatment, except for possible construction monitoring. Resources that are determined to be significant are provided protection under existing statutory and regulatory authorities.

b. Treatment

Mitigation of Significant Sites. If a resource is significant or NRHP eligible, the nature and extent of impacts resulting from a project are determined and a plan is developed for mitigating the adverse effects. Often impact avoidance, through project redesign, is not possible or practical and alternative mitigation measures (rehabilitation, data recovery, and analysis) must be instituted. All alternatives to preservation in place cause some loss of resource integrity. Therefore, the nature of this loss and any data recovered through mitigation activities must be documented.

Monitoring of Potentially Significant Sites. On-site monitoring is undertaken during any ground-disturbing activity if potential for

subsurface deposits exists. Monitoring conducted as part of construction verifies that mitigation measures are effective and ensures against loss of any previously undiscovered significant resource(s) uncovered during construction activities. Long-term operational monitoring may be required to identify any changes in the physical status of a resource that results in the loss of integrity.

c. Priorities

Long-term priorities are in effect for more than four years or extend into more than one funding cycle. Long-term priority goals relate to the consistent implementation of the procedures for accomplishing the cultural resource management objectives of the two Preserves. Goals are to:

a. Protect and Manage Identified Cultural Resources. Maintain cultural resource protection measures through proper planning for avoidance of adverse effects, maintain site markings as appropriate, enforce historic preservation regulations for all Preserve users, and develop and maintain an archaeological site monitoring program.
b. Encourage Public Involvement. Cooperate with interested local historical and archaeological groups, local Native American tribes, and educational institutions in developing a plan to promote public participation in historic preservation and enjoyment of cultural resources at the two preserves.

D. Cultural Resource Management Guidelines

1. Evaluating Significance

Establishing historic contexts is the first standard outlined in the *Secretary of the Interior's Standards for Preservation Planning* section of the National Historic Preservation Act (Sec. 110). The historic context of a cultural resource is used to determine the significance of a resource under section 106 of the NHPA. A cultural resource's historic context is a combination of the geographic location and surrounding area, time period of resource significance, historical themes or research questions the resource can address, and potential Native American significance. Historic contexts are derived from recorded site information and from prehistoric and historic background information.

The historic context organizes information based on cultural themes and their geographical and chronological limits, describing significant broad patterns of development that may be represented by individual archaeological sites.

Significance assessments are designed to systematically quantify those values that make archaeological resources important to historic preservation, to scientific research, to Native Americans, and to the public.

Assigning significance levels for individual cultural resources and in some cases, classes of site types (e.g., prehistoric trails, hearths, lithic workshops, sparse lithic scatters) is also a useful step towards organizing.

Site-specific contexts should include time period of occupation, identification of occupants, and site function. Additional context can be established by assessing how the site fits into broad regional themes. These can include Native American, transportation, ranching, exploration, and military. The historical context is used to generate research questions needed to evaluate individual sites.

Section 106 of the National Historic Preservation Act significance criteria states that:

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling and association, and:
>
> Criterion A - That are associated with events that have made a significant

contribution to the broad patterns or our history; or

Criterion B - That are associated with the lives of persons significant in our past; or

Criterion C - That embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguish-able entity whose components may lack individual distinction; or

Criterion D - That have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

A National Register eligible site must meet one or more of the above criteria. Each criterion must be justified. In most cases, prehistoric sites are justified under criterion D; historic era properties may also qualify for listing under criteria A, B, or C. Suggested procedures for evaluating resources under NRHP guidelines are listed in Appendix 7.

Under special conditions, religious properties, moved properties, birthplaces and graves, cemeteries, reconstructed properties, commemorative properties, and properties less than 50 years old are eligible for listing in the National Register. These conditions/criteria include:

- Religious property may be eligible if it derives its primary significance from architectural or artistic distinction or historical importance;
- Property removed from its original or historically significant location can be eligible if it is significant primarily for architectural value or it is the surviving property most importantly associated with a historic person or event;
- Birthplace or grave of a historical figure may be eligible if the person is of outstanding importance and if there is no other appropriate site or building directly associated with his or her productive life;
- Cemetery may be eligible if it derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from associations with historic events;
- Reconstructed property may be eligible when it is accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan and when no other building or structure with the same associations has survived;
- Property primarily commemorative in intent can be eligible if design, age, tradition, or symbolic value has invested it with its own historic significance; and
- Property achieving significance within the last 50 years may be eligible if it is of exceptional importance.

Traditional Cultural Properties (TCP) are often associated with Native American resources and properties that are associated with cultural practices or beliefs of a living community However, a TCP may also include traditions, beliefs, practices, lifeways, arts, crafts, and social institutions of any community. Examples of TCPs include:

- A location associated with the traditional beliefs of a Native American group about its origins, cultural history, or the nature of the world;
- A rural community whose organization, buildings and structures, or patterns of land use reflect the cultural traditions valued by its long-term residents;
- An urban neighborhood that is the traditional home of a particular cultural group, and that reflects its beliefs and practices;
- A location where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice; and
- A location where a community has traditionally carried out economic, artistic, or other cultural practices important in maintaining its historical

identity (National Register Bulletin #38).

CEQA (Appendix K, Section III) defines a significant archaeological site as:

1. Associated with an event or person of:
   a. Recognized significance in California or American history; or
   b. Recognized scientific importance in prehistory; or
2. Can provide information which is of both demonstrable public interest and useful in addressing scientifically consequential and reasonable or archaeological research questions; or
3. Has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind; or
4. Is at least 100 years old and possesses substantial stratigraphic integrity; or
5. Involves important research questions that historic research has shown can be answered only with archaeological methods.

Prehistoric archaeological sites usually meet Criteria 5.

As defined by the Environmentally Sensitive Lands Ordinance (ESL; City of San Diego Municipal Code, Section 101.0462, revised September 1999), significant prehistoric and historic sites or resources are defined as:

> Locations of known prehistoric or historic resources that possess unique scientific, religious, or ethnic value of local, regional, state or federal importance. The above shall be limited to prehistoric or historic districts, sites, buildings, structures, or objects included in the State Landmark Register, or the City of San Diego Historical Sites Board List, or included in or eligible for inclusion in the National Register of Historic Places; areas of past human occupation where important prehistoric or historic activities or events occurred (such as villages or permanent camps); and locations of past or current traditional religious or ceremonial observances as defined by Public Resources Code Sec 5097.9 et seq., and protected under Public Law 95-341, the American Indian Religious Freedom Act (such as burials, pictographs, petroglyphs, solstice observation sites, and sacred shrines) (San Diego Municipal Code Section 101.0462).

The significance of the resource is based on the potential for the resource to address important research questions documented in a site-specific technical report prepared as part of the environmental review process. An archaeological site must consist of at least three associated artifacts/ecofacts (within 50-square-meter area) or a single feature and must be at least 45 years of age. Archaeological sites containing only a surface component are generally considered not significant, unless demonstrated otherwise. Such site types may include isolated finds, bedrock milling stations, sparse lithic scatters, and shell processing stations. All other archaeological sites are considered potentially significant.

The evaluation program for prehistoric sites includes surface collection (diagnostic artifacts) and subsurface testing (e.g., shovel test pits [STPs], excavation units, remote sensing). Evaluation of historic archaeological sites requires research as well as some form of subsurface testing. If a site is determined to be significant and if a proposed undertaking will have an adverse effect on the site, a treatment plan will be required.

The treatment plan will detail the undertaking, significance of the site(s), and level of impact to the site. The habitat manager will consult with SHPO or the Tribal Historic Preservation Officer (THPO) and other consulting parties to seek ways to avoid, minimize, or mitigate any adverse effects.

Assessment of significance can be determined in two ways depending on the

depth and detail of site-specific data. Significance values must be scored by a professional archaeologist prior to initiating any action other than site avoidance. Four categories of significance (Levels 1 through 4) have been developed as a management tool. They are not part of a federal or state law. For administrative purposes, four levels of site significance are given below:

Significance Level 1: very complex archaeological sites with substantial buried deposits (e.g., midden); known or high potential for Native American cremations; potential for stratigraphic integrity and preserved subsurface features; high potential to yield information to address numerous research questions from many research domains; for historic sites, archaeological research potential is greater when corresponding archival documentation is poor or lacking.

Significance Level 2: archaeological sites with the potential for buried deposits; potential to address several research questions; potential for stratigraphic integrity and preserved subsurface features.

Significance Level 3: surface or relatively shallow archaeological deposits; probable absence of stratigraphic integrity and chronological indicators; limited potential to address research questions.

Significance Level 4: surface or relatively shallow archaeological deposits or scatters; limited data potential to address a few narrowly defined research questions, and where questions are resolved mostly or entirely through documentation.

Resources that are determined not significant do not require data recovery or additional documentation.

2. Monitoring

An important part of the management plan is development of a monitoring program for use during undertakings, and a treatment plan for unanticipated discoveries, to ensure that trails, land use, and other elements of the Preserve will not have an adverse effect on cultural resources. If there is an undertaking, such as trail improvement, increased public use of the area, the boundaries of cultural resources determined to be significant should be clearly flagged and possibly fenced to avoid any inadvertent impacts to the site. If avoidance is not possible, a treatment plan will be developed.

The objective of a cultural resource monitoring program is to provide an immediate, educated on-site archaeological response and evaluation for any resources that are revealed during brushing, trail construction, property improvement, and/or any ground disturbing activity. Monitoring also provides a means of maintaining protective buffers around previously identified cultural resources that have been determined to be important.

Archaeological monitors record archaeological remains exposed during ground disturbing activities and document and ensure proper treatment of any "new" finds discovered during any ground disturbance. The role of the in-field cultural resource monitor is diagnostic and advisory. The monitor(s) will be prepared to evaluate discoveries and to advise the agency of their needs. The individuals tasked with field monitoring will coordinate with the construction contractor or regulatory agency for scheduling and their corresponding field presence requirements. Proposed project plans should also be marked with requirements for monitoring.

Preconstruction meetings will allow the cultural resource monitor to establish protocol and point of contact information with the construction contractor(s). The role and responsibilities of the monitor will also be presented at this initial meeting.

The definition of a qualified cultural resource monitor is an individual with a bachelor's degree in anthropology or archaeology and one year of field experience in southern California. The Principal Investigator will satisfy the requirements for enrollment on the Register of Professional Archaeologists and must meet the Secretary of the Interior's professional standards.

3. Unanticipated Discoveries

In the event that a "new" or unanticipated archaeological site is discovered or a previously unknown locus or buried component is found at a recorded site, the archaeological monitor will immediately report the discovery to the Principal Investigator and construction supervisor so that appropriate treatment measures can be implemented. The same procedures will be followed in the unlikely event that archaeological remains are encountered during construction in any area not being archaeologically monitored.

Unanticipated discoveries are defined as:

- Previously unidentified archaeological sites, as defined by CEQA and professional guidelines; or
- Artifacts or cultural materials within archaeological sites previously determined to be ineligible for further treatment which are qualitatively distinct from artifacts and cultural materials previously identified at the site and which indicate that the site has the potential to qualify as eligible for further treatment based on its potential to provide data; or
- Artifacts or cultural materials within archaeological sites previously determined to be eligible for further treatment which are qualitatively different from artifacts and cultural materials previously identified and/or investigated in the impacted portion of the site and which indicate that the impacted portion of the site has the potential to contribute to the eligibility of the site based on its potential to provide data relevant to the sorts of research issues defined in the project research design.; or
- Any evidence of human remains regardless of context of discovery. All discoveries of bone will be treated by construction personnel as potential human remains until a determination can be made by the field archaeologist and/or project manager.

Discoveries which do not qualify as unanticipated discoveries include prehistoric and historic era isolates:

- Isolated prehistoric flaked stone and groundstone artifacts, burned rock, or non-human bone outside the boundaries of previously defined archaeological sites. The field archaeologist may be able to determine if any discovered bone is non-human; in this event, the find does not qualify as a discovery unless accompanied by other materials justifying its identification as an unanticipated discovery. If there is any question that the bone may be human, it must be treated as an unanticipated discovery.
- Isolated historic artifacts outside the boundaries of a previously defined archaeological site.
- Artifacts or materials within an archaeological site previously evaluated as ineligible for either the California Register or the National Register, which are qualitatively consistent with materials previously identified at the site.

Not all archaeological deposits (historic properties) are possessed of the same data potential. Some sites, such as stratified midden deposits, can yield a diverse and rich assemblage of artifacts, ecofacts, and possibly features. Data sets of this type can be used to address research questions regarding cultural chronology, paleoenvironmental reconstruction, site formation processes, and past lifeways. An appraisal is made of recovered archaeological materials from these sites to determine their potential in this regard. Other sites, such as sparse lithic scatters, are anticipated to contain a narrow variety of archaeological data with the result being limited research applications. A critical element of evaluation by the archaeological consultant is the research potential, or, in legal terminology, the significance of newly discovered sites.

Following the discovery of unanticipated archaeological deposits, construction activities will be redirected to other work areas, with an assigned monitor, while the horizontal limits of the discovery are determined.

Determination of the horizontal limits will be assessed as precisely as possible through completion of both surface and subsurface examination. A temporary exclusion zone will be marked around the assessed deposit limits using posts and survey ribbon of a predetermined color. Signs will also be placed to identify the exclusion zone. Subsurface probes will be used to aid in determining the horizontal and the vertical extent of the deposit. The subsurface probes may be excavated by hand or by mechanical means.

The proposed approaches for unanticipated resource deposits will vary according to the types of sites found. At sites with limited data potential (e.g., low-density/low-diversity artifact or ecofact scatters), the management will focus on recording the attributes of the deposit and its stratigraphic context. In addition, sampling may be reduced to judgmental removal of trench sidewall materials for descriptive information or for radiocarbon samples. More complex deposits will be treated through a data recovery program in a manner consistent with their perceived potential and by using a sampling design that maximizes the recovery of meaningful data.

4. Cultural Resource Management Recommendations

a. Protect Cultural Resources During Restoration or Development

Although no specific plans for management or improvement have been developed, basic rules for procedures are proposed to cover potential situations. As specific plans for development or restoration are proposed, a literature search should be conducted through the South Coastal Information Center and the San Diego Museum of Man to inventory recorded prehistoric and historic cultural resources in the area of work. In addition to this archival research, a field survey should be conducted by a qualified archaeologist to determine if unrecorded cultural resources are present. Since initial site mapping can be inaccurate, a field survey will also confirm or adjust recorded site boundaries to conform to current conditions. In the event cultural resources are found on the proposed area of impact, plans can be modified to reduce or remove potential impacts. If development or restoration designs cannot feasibly be modified to remove impacts, an evaluation plan should be proposed and implemented by a qualified consultant.

b. Maintain a Trail System that Avoids Significant Cultural Resources

A trail system is proposed in this management plan in Chapter 5. Roads such as SDG&E access roads will be kept open for necessary utility maintenance. In addition to protecting and enhancing biological resources, the proposed trail system has been designed to avoid sensitive cultural resources. This is especially true of CA-SDI-4904, which presently has a dirt road running through its western edge. Work to restore native vegetation on abandoned trails and roads near archaeological sites should be planned to limit impacts to within the disturbed areas only. Erosion control measures on retained trails should also be planned and carried out without impacting cultural resources. These measures are compatible with the goal of preserving the native vegetation on the Preserves.

c. Site Facilities Away from Cultural Resources

Any proposed buildings or other visitor-related facilities should be sited with cultural

resources in mind. Facilities should be planned to avoid existing site locations and their immediate vicinity. Locating facilities near sites increases the potential for impacts from foot traffic and vandalism. Locating facilities in areas that have already been disturbed will avoid new impacts to cultural resources. If there is an undertaking, such as trail improvement or new facility construction, the boundaries of adjacent significant cultural resources should be clearly flagged and fenced, if possible, to avoid any impacts to the site If avoidance is not possible, a treatment plan should be developed to address impacts.

d. Maintain a Database of Cultural Resources on the Preserves

An important aspect of Preserve management will be the development and implementation of a geographic information system (GIS)–based resource information program for the floral, faunal, and cultural resources of the Preserves. An initial program of field surveys to relocate and refine site boundaries should be conducted to add up-to-date information on site sizes and conditions. A comprehensive database will provide information for evaluating known contents and locations of culturally sensitive areas. With such information available to preserve managers, it will be easier to avoid cultural resources at the initial planning stage of a specific project. In particular, trail redesign and new trail planning can be checked with mapped site locations to insure these resources are avoided. This information will also be valuable in long-range management planning.

e. Establish a Cultural Resources Educational/Interpretive Program for the Preserves

Cultural resources should be included in any educational/interpretive program implemented for the Preserves. Interpretive signs or displays can be used to explain prehistoric uses of the Preserves' natural resources. This information could be installed either in a central visitors' center, if one is proposed, or as signs along the trails. A visitors' center display should contain photographs of the cultural resources on the Preserve shown in such a way that their specific location cannot be discerned. A visitor's center could also exhibit artifacts used to procure resources from the area. Trail signage could be used to identify specific plants used by Native Americans. Signs with information about the cobble and other geologic resources can also be informative, but should not be placed near actual quarries or flaking stations. Local Native American input should be solicited at the development stage of the educational/interpretive program.


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Chapter Eleven

Interpretation, Public Education, and Resource Protection

Interpretation and education has become a widespread management tool of natural resources as it has the capacity to reduce inappropriate behavior voluntarily through education (Black 2002). Until the benefits of education and interpretation were recognized, management strategies generally were focused on physical controls such as barriers, boardwalks, and the location of facilities, as well as regulatory controls (Orams 1996; Hall and McArthur 1996).
The level and type of education and interpretation will depend on the needs, interests, and expectations of the visitor and may include a wide range of interpretive media.
Like the management of the Preserves, the interpretation and educational tasks need to adapt to changes and must respond to the needs of the Preserves.
The long-term success of the Preserves and the concept of habitat protection are dependent on the Preserve's acceptance by local community residents as valuable amenities and resources. A belief in open space as a part of their community causes residents and local schools to become interested and protective of the resource. Consequently, residents and local schools not only refrain from disturbing the resource but also inform others of its importance, to prevent vandalism and unauthorized activities from occurring within the open space. In this manner, by becoming stewards of the open space preserve areas, community members provide a valuable service to the Habitat Manager and the preserve, as their vigilance affords protection to the area when the Habitat Manager is not present (Affinis 1998; Helix 2000).
It is the Habitat Manager's responsibility to work with the community as much as possible and take steps to maintain a positive working relationship between the community and the habitat management program.

A. Interpretation

1. Signs

a. Educational Signs

Information regarding the general ecological, faunal, and floral resources, especially those resources that are endemic, endangered, or threatened on both preserves should be adequately provided via signage, pamphlets, and at informational kiosks at major trail entrance designations. Signage is recommended at particularly sensitive habitat areas, such as at the vernal pool and the short-leaved dudleya habitat areas. Education signs should be placed at trailheads and at other opportune locations where they will be frequently encountered. Signs should be interpretive of the open space, and cover such topics as purpose, ecological descriptions, common species, and importance of the open space in and of itself and as a part of a subregional system.

The educational signs should include space to post notices on such topics as herbicide use dates, rattlesnake warnings, scheduled trail repair or maintenance, and other items of concern.

b. Advisory Signs

Signs informing the public about restrictions to protect the Preserves should be posted at trailheads. Restrictions include activities such as poaching, allowing dogs to be off leashes, harassing or killing endangered or other animals, removing reptiles as pets, fires, littering, and removal of plant material.

Other advisory signs could encourage visitors to pick up trash and to notify the Habitat Manager of violation.

c. Trail Signs

Signage should be placed at all trailheads and throughout the Preserves showing the location of the sign in regards to the trail system and itemizing the uses allowed on each type of trail. Signs at the beginning of trails will indicate what type of trail is being accessed. View points and other points of interest will be marked on the trails with signs that point in the direction of the point of interest.

Signs will be marked with a line with arrows at both ends or circle with an arrow indicating whether the trail is a loop or a through or connecting trail that could lead out of the preserve. This information will also be stated on the signs in plain English. All signs will bear the adopted symbol of the preserve system.

The signs should also include language regarding fines for trespassing into restricted areas, and biking or horseback riding on single track trails.

2. Interpretive Trail

One trail at each of the Preserves should be designated for interpretation. Signs should be placed at locations along the trail briefly describing the resources. An interpretive trail brochure should be designed to provide additional information regarding the resources.

B. Public Education

The following steps should be taken to facilitate both public awareness of the open space and coordination between the Habitat Managers of other properties.

1. Communication

The Habitat Manager shall, when working on-site, answer questions and explain the open space to local residents and students initiating inquiries.

2. Volunteer Services

Volunteer services are both a method of and a result of public awareness. Volunteer services, while working within a particular project area, are normally developed at the subregional or regional level. The Habitat Manager shall participate in subregional or regional programs that encourage and feasibly use volunteer services. Continual volunteer programs may be established, allowing students the opportunity to volunteer and aid the Habitat Manager in the maintenance of the open space.

3. Newsletter

The Habitat Manager shall prepare or contribute to the preparation of a monthly newsletter for distribution to local schools, residents of the adjacent properties, stakeholders, and wildlife agencies. The newsletter will serve to remind the community of the open space, its protected status, reasons for its establishment and ongoing existence, information on regional open space happenings, and any other information deemed pertinent by the Habitat Manager. Production and distribution of the newsletter will be coordinated through the Management Committee.

4. Trail Guide

A trail guide should be prepared and provided at the information kiosks at the Preserves.

5. Website

A website with a map to the Preserves, and with trails maps of the Preserves should be

established, and linked to websites of public landowners of the Preserves.

6. Docent Program

A docent program should be established. Docents could lead field trips, participate in presentations at the Preserves, monitor the trails, and generally watch over the Preserves. Docents provide outreach into all parts of the community through their help at the Preserves.

7. Adopt-a-School Program

Each Preserve could adopt a local school. Programs could be developed to teach the children about natural resources through presentations and walks, and provide hands-on experience in small habitat restoration, exotic species control, and maintenance projects.

C. Resource Protection

The resources at the two Preserves must be protected. This management plan has presented many avenues of managing and monitoring the Preserves for the benefit of the public. However, members of the public sometimes harm resources.

1. Law Enforcement

Everyone who visits the Preserves and who lives in the neighboring communities should be informed on actions to be taken if they see harm being done to or at the Preserves. Following are some actions the Habitat Management and the oversight committee could take to enforce rules, regulations, and laws at the Preserves:

- One phone number, probably that of the Habitat Manager, should be identified prominently on signs, in newsletters, in brochures, and on the website that someone can call if they see harmful, or illegal actions. A good way to disseminate this phone number is to pass it out on refrigerator magnets.
- Criminal activities should be reported immediately to the San Diego Police Department.
- The Habitat Manager should have a ready reference of other numbers to call, such as the police department, fire department, and wildlife agencies.

2. Violations

City Park Rangers should be assigned to the Preserves and should patrol on the weekends. They should be empowered to issue City citations for violations such as riding motorcycles on the Preserves, allowing dogs to run off leashes, and collecting plant or animal species.

Chapter Twelve
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